

**STATEMENT(S) CONCERNING COMMON OWNERSHIP**

1. Application 10/564,590 and US Publication No. 2003/0120005 (Webb) A1 were, at the time of the invention of Application 10/564,590 was made, owned by The Dow Chemical Company.
2. Application 10/564,590 and US Patent No. 6,777,512 B1 (Sonnenschein) were, at the time of the invention of Application 10/564,590 was made, owned by The Dow Chemical Company.

## REMARKS/ARGUMENTS

### Amendments to the Claims

Basis for the amendment to Claims 1 and 9 limiting the pipe and the object to polyethylene, polypropylene, or mixtures thereof can be found in the specification on page 4, lines 4 to 5 and page 7, line 29 to page 11, line 3. No new matter is added.

Please delete original Claims 4, 5, 6, and 22.

### Summary of the Invention

Polyethylene and polypropylene resins possess a good blend of physical properties well suited for pipe and piping applications. However, polyethylene and/or polypropylene resins have found little use in piping because conventional adhesives (typically a mixture of the pipe resin in a solvent wherein the use of such adhesives is sometimes called solvent bonding or solvent welding) are ineffective in providing an adequate bond when polyethylene and/or polypropylene pipes are joined. Mechanical bonding methods (couplings) for polyethylene and/or polypropylene pipe are not cost competitive or technically suitable for many pipe applications. Thermal bonding methods have been developed to join polyethylene and/or polypropylene pipe, however there are several disadvantages to thermal bonding methods. The disadvantages of thermal bonding methods are discussed in more detail in the application, but in general, they suffer from being cumbersome, costly, and requiring specialized equipment. These methods have restricted the widespread use of polyethylene and/or polypropylene in commercial pipe applications. There has been a long felt need for a method to join polyethylene and/or polypropylene pipe effectively, efficiently, and cost effectively using an adhesive.

The present invention is such a method for joining polyethylene and/or polypropylene pipe using an effective amount of a curable one or two part adhesive composition which comprises a boron containing initiator compound, one or more monomers, oligomers, polymers or mixtures thereof having olefinic unsaturation which is capable of polymerization by free radical polymerization, and optionally a decomplexing agent.

### **Claim Rejections**

The Examiner has rejected Claims 1 to 10 and 14 to 21 under 35 U.S.C. 103(a) as being unpatentable over GB 1,112,326 (GB '326) in view of Zharov (EP 1029906). GB '326 discloses a method of bonding a pipe/spigot 5 and a socket fitting comprising a bell 2. Zharov discloses an adhesive composition comprising a boron containing initiator that provides adhesion between low surface energy substrates that are otherwise difficult to bond.

Applicant argues, contrary to the Examiner's statement, that GB '326 is not silent as to the makeup of the adhesive composition. GB '326 discloses that the adhesive employed to bond the pipe is an adhesives conventionally used. One skilled in the art knows that conventional adhesives to bond pipe, such as pipe made from polyvinyl chloride (PVC, which is the only resin specifically disclosed in GB '326) is a solution of the resin the pipe is made from dissolved in an appropriate solvent, for PVC it would typically be 10 to 20 percent PVC resin dissolved in a strong solvent like tetrahydrofuran (THF). So while GB '326 does not explicitly disclose the composition of the adhesive, the composition (e.g., 10-20% PVC in THF) would be implicit to one skilled in the art.

Applicant further argues, contrary to the Examiner's statements, that GB '326 does not explicitly or implicitly teach or suggest Applicant's pipe made of polyethylene or polypropylene. Moreover, even if GB '326 did teach or suggest Applicant's polyethylene or polypropylene pipe (which it does not), Applicant asserts that there is no motivation to combine GB '326 with Zharov because the conventional adhesive of GB '326 fully meets the adhesive bonding requirements of the invention disclosed therein; therefore, the use of, or need for, an adhesive (such as used in Applicant's method to join pipe) other than a conventional adhesive is not taught or suggested. Conversely, there is no motivation in Zharov to combine its boron containing initiator adhesive with GB '326 as Zharov is silent as to the use of the disclosed adhesive to join/bond pipe of any kind.

GB '326 discloses joining "plastic pipes, particularly synthetic thermoplastics, for example polyvinyl chloride [PVC] pipe". The Examiner states (page 2, paragraph 2) "the method of GB '326 is broadly directed to the class of synthetic materials, which include the well known polyolefin materials described by GB '326. **It is emphasized that the method of GB '326 includes bonding of polyethylene or**

**polypropylene pipes...**" (bold underlining by Applicant). GB '326 does not explicitly disclose polyethylene or polypropylene. The only resin that GB '326 explicitly discloses is polyvinyl chloride.

While GB '326 discloses pipes made of "synthetic thermoplastics material" it also stipulates that "[i]f the joint is to be adhesively sealed, as illustrated in Figure 1, then an adhesive conventionally used for such a purpose is applied either to the outside of the spigot end of pipe 5 and/or to the inside of the cooperating socket...". Other than mechanical or thermal bonding, one skilled in the art would interpret "an additive conventionally used" as solvent bonding. As described in Takeuchi (previously cited by the Examiner) conventional adhesives used for solvent bonding comprise the same resin that is used to make the pipe dissolved in a solvent. These conventional adhesives are applied between the two pipes being joined. The solvent of the adhesive also dissolves some of the pipe resin. As the solvent evaporates, the dissolved resin at the surface of the pipe and the dissolved resin in the adhesive mechanically intertwine to form a physical/mechanical bond. For pipe that can be solvent bonded, solvent bonding with these conventional adhesives is presently the most common and widely practice adhesive in the art and this is what is disclosed in GB '326.

However, one skilled in the art knows that not all synthetic thermoplastic materials can be bonded with conventional adhesives. Further, one skilled in the art knows that there is no such "conventional adhesive" which will adequately bond pipe made from polyethylene or polypropylene (e.g., an adhesive comprising polyethylene in solvent or polypropylene in solvent, respectively). Applicant asserts, not even through hindsight, would one skilled in the art would interpret GB '326 as teaching or suggesting the use of polyethylene or polypropylene as the pipe material to be adhesively bonded in the invention disclosed therein. Therefore, GB '326 does not explicitly or implicitly disclose the use of Applicant's polyethylene or polypropylene pipe.

Moreover, GB '326 does not teach or suggest (1) the need for any type of adhesive other than conventional resin/solvent adhesives or (2) that conventional adhesives demonstrate any deficiencies and an alternative be sought. Therefore, even if GB '326 taught or suggested polyethylene or polypropylene pipe, which it does not,

there is no motivation to combine GB '326 with Zharov to arrive at Applicant's invention.

Zharov boron containing initiator adhesive is not a conventional adhesive as disclosed in GB '326. Further, Zharov does not teach or suggest the use of its boron containing initiator adhesive to bond pipe of any kind. Therefore, there is no motivation to combine Zharov's boron containing initiator adhesive with GB '326. Even if one did, you would still not arrive at Applicant's present invention as neither teach or suggest polyethylene or polypropylene pipe.

The Examiner's rejection of Claims 4 to 6 are moot as these claims have been deleted.

Applicant's response to the Examiner's rejection of Claims 7 to 10 and 14 to 19 has been addressed hereinabove.

Regarding the Examiner's rejection of dependent Claims 20 and 21, one skilled in the art knows that the solvents used in conventional adhesives as disclosed in GB '326 (e.g., THF, acetone, methylene chloride, etc. ) far exceed the VOC limits claimed in Claims 20 and 21. Zharov is silent as to the VOC emissions of the adhesives disclosed therein, however as argued hereinabove there is not motivation to combine Zharov with GB '326. Applicant asserts that the present invention as claimed in currently amended Claims 1 and 9, previously amended Claim 10, and original Claims 2, 3, 7, 8, and 12 to 21 are nonobvious over GB '326 in view of Zharov.

The Examiner has rejected Claims 1 to 10, 12, and 14 to 21 under 35 U.S.C. 103(a) as being unpatentable over GB '326 in view of US 2003/0120005 (Webb). Under the section entitled Statement(s) Concerning Common Ownership found on page 10 of this paper, Applicant states that Application 10/564,590 and US Publication No. 2003/0120005 A1 were, at the time of the invention of Application 10/564,590 was made, owned by The Dow Chemical Company hereby disqualifying US 2003/0120005 under U.S.C. 103(c) as prior art under 35 U.S.C. 103(a) (MPEP 706.02(l)(1) and 706.02(l)(2)). Applicant believes the rejection of Claims 1 to 10, 12, and 14 to 21 under 35 U.S.C. 103(a) as being unpatentable over GB '326 in view of US 2003/0120005 (Webb) have been overcome.

The Examiner has rejected Claims 1 to 10 and 12 to 21 under 35 U.S.C. 103(a) as being unpatentable over GB '326 in view of US 6,777,512 B1 (Sonnenschein).

Under the section entitled Statement(s) Concerning Common Ownership found on page 10 of this paper, Applicant states that Application 10/564,590 and US Patent No. 6,777,512 B1 were, at the time of the invention of Application 10/564,590 was made, owned by The Dow Chemical Company hereby disqualifying 6,777,512 B1 under U.S.C. 103(c) as prior art under 35 U.S.C. 103(a) (MPEP 706.02(l)(1) and 706.02(l)(2)). Applicant believes the rejection of Claims 1 to 10 and 12 to 21 under 35 U.S.C. 103(a) as being unpatentable over GB '326 in view of US 6,777,512 B1 (Sonnenschein) have been overcome.

The Examiner has rejected Claim 22 under 35 U.S.C. 103(a) as being unpatentable over Yamaguchi (JP 11311392) in view of Zharov. Claim 22 has been deleted.

## CONCLUSIONS

In view of the preceding amendments and remarks, Applicant believes all grounds of rejection have been fully traversed and Applicant's currently amended Claims 1 and 9, previously amended Claim 10, and original Claims 2, 3, 7, 8, and 12 to 21 are patentable in full. Accordingly, their reconsideration and allowance at the earliest possible convenience is courteously solicited.

Respectfully submitted,

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